

10-30-00

EL 668416569

A



Practitioner's Docket No. SST/1061

PATENT

Preliminary Classification:
Proposed Class: 52
Subclass:

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Box Patent Application
Assistant Commissioner for Patents
Washington, D.C. 20231



NEW APPLICATION TRANSMITTAL

Transmitted herewith for filing is the patent application of

Inventor(s): Karen W. Colonias; Alfred D. Commins; William D. Georges; Stephen B. Lamson; William F. Leek; Gregory S. Powell

For (title): STRAP TIE HOLDER

1. Type of Application

This transmittal is for an original (nonprovisional) application.

2. Papers Enclosed

A. Required for filing date under 37 C.F.R. 1.53(b) (Regular) or 37 C.F.R.

CERTIFICATION UNDER 37 C.F.R. SECTIONS 1.8(a) AND 1.10*

(When using Express Mail, the Express Mail label number is **mandatory**;
Express Mail certification is optional.)

I hereby certify that, on the date shown below, this correspondence is being:

MAILING

deposited with the United States Postal Service in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

37 C.F.R. Section 1.8(a)

37 C.F.R. Section 1.10*

with sufficient postage as first class mail.

as "Express Mail Post Office to Address"
Mailing Label No. _____ (**mandatory**)

EL668416569US

TRANSMISSION

transmitted by facsimile to the Patent and Trademark Office (703)

Date: October 27, 2000

Signature

Nicolas S. Gold
(type or print name of person certifying)

*WARNING: Each paper or fee filed by "Express Mail" **must** have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. Section 1.10(b).

"Since the filing of correspondence under [Section] 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will **not** be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.

1.153 (Design) Application

8 Page(s) of Specification
5 Page(s) of Claims
10 Sheet(s) of Drawing(s)--Informal

B. Other Papers Enclosed

1 Page(s) of abstract

3. Declaration or Oath

Not Enclosed.

Application is made by a person authorized under 37 C.F.R. Section 1.41(c) on behalf of all of the above-named inventors.

4. Inventorship Statement

The inventorship for all the claims in this application is not the same. An explanation, including the ownership of the various claims at the time the last claimed invention was made, will be submitted.

5. Language

English

E 668416569

6. Fee Calculation (37 C.F.R. Section 1.16)

Regular Application

CLAIMS AS FILED

Claims	Number Filed	Basic Fee Allowance	Number Extra	Rate	Basic Fee 37 CFR 1.16(a) \$710.00
Total Claims (37 CFR 1.16(c))	21	- 20 =	1 x	\$18.00	\$18.00
Independent Claims (37 CFR 1.16(b))	1	- 3 =	0 x	\$80.00	\$0.00
Multiple Dependent Claim(s), if any (37 CFR 1.16(d))			+ \$270.00		\$0.00

7. Fee Payment Being Made at This Time

Enclosed
Filing Fee check # 6406 \$728.00

Total Fees Enclosed \$728.00

8. Method of Payment of Fees

Check in the amount of \$728.00 is attached. Check # 6406

9. Authorization to Charge Additional Fees

The Commissioner is hereby authorized to charge the following additional fees by:

this paper and during the entire pendency of this application to Account No. 03-4075.

37 C.F.R. Section 1.16(a), (f) or (g) (filing fees)

37 C.F.R. Section 1.16(b), (c) or (d) (presentation of extra claims)

37 C.F.R. Section 1.16(e) (surcharge for filing the basic filing fee and/or declaration on a date later than the filing date of the application)

37 C.F.R. Section 1.17(a)(1)-(5) (extension fees pursuant to SECTION 1.136(a))

37 C.F.R. Section 1.17 (application processing fees)

10. Instructions as to Overpayment

Credit Account No. 03-4075.

Date: October 27, 2000

Reg. No.: 41694
Tel. No.: 1-510-832-4111
Customer No.: 498

Charles R Cypher
Signature of Practitioner

Charles R. Cypher
Law Offices of James R. Cypher
405 14th Street, Suite 1607
Oakland, CA 94612-2777

1 Title: STRAP TIE HOLDER

**Inventors: Karen W. Colonias, Alfred D. Commins, William D. Georges,
Stephen B. Lamson, William F. Leek, Gregory S. Powell**

BACKGROUND

5 This invention relates to a connection securing a strap connector to a support member. In particular, the holder of the present invention is designed to quickly and inexpensively permit temporary connection of strap tie holdowns to formboards during the pouring of concrete foundations.

Earthquakes, hurricanes, tornadoes, and floods impose forces on a
10 building that can cause structural failure. To counteract these forces, it has become common practice to strengthen or add ties between the structural members of a building in areas where such cataclysmic forces can occur.

One of the most critical connections that should be made is between the support walls of a building and its foundation. In such an application, the
15 connector or anchoring member embedded in the concrete foundation will often be placed near the side surface of the foundation. This is because the support walls of buildings are often built at the edges of the foundation. When an embedded anchor or connector is located near the side surface of a foundation, it is important that the concrete form a continuous member
20 between the connector and the side surface to protect the connector from the elements and to maximize the concrete's hold on the embedded connector. Strap tie holdown connectors are designed to run along the outside of the shear wall, rather than through it as connectors that use anchor bolts do. Because shear walls are generally located with their outer
25 side surface generally in line with the outer side surface of the stem wall foundation, the strap tie holdown connector, ideally, should protrude from the foundation at the interface of the outer side surface and upper surface of the foundation.

All holdowns must be suspended in place before the concrete
30 foundations in which they are to be embedded are poured, but in the case of strap tie holdowns it is especially critical that the placement be as accurate as possible. In the prior art, strap tie holdowns have simply been nailed to the formboards. Alternatively, devices have been clipped to the formboard that allow fasteners to be passed through both the device and the strap tie
35 holdown, thereby hanging the strap tie holdown in place. Such devices are

- 1 however limited by congruence of openings in the device and in the strap tie holdown.

SUMMARY OF THE INVENTION

- 5 An object of the present invention is to provide an improved means of holding strap connectors and temporarily connecting them to support members, particularly for holding strap tie holdowns and temporarily connecting them to formboards during the pouring of concrete foundations.
- 10 A benefit of the present invention is that it can provide an adjustable connection for holding strap connectors, allowing selected strap connectors to be held in a variety of positions along their length.

A benefit of the present invention is that the strap tie connector can be, but need not be directly nailed to the formboard.

- 15 A further benefit of the present invention is that the strap tie connector can be attached to the formboard by a holder that lies above the level of the cement foundation, such that the cementitious member is less disturbed.

DESCRIPTION OF THE DRAWINGS

- 20 FIG. 1 is a perspective view of a preferred embodiment of the holder of the present invention.
- FIG. 2 is a top plan view of the preferred embodiment of the holder of the present invention shown in FIG. 1.
- FIG. 3 is a front elevation view of the preferred embodiment of the holder of the present invention shown in FIG. 1.
- 25 FIG. 4 is a bottom plan view of the preferred embodiment of the holder of the present invention shown in FIG. 1.
- FIG. 5 is a back elevation view of the preferred embodiment of the holder of the present invention shown in FIG. 1.
- 30 FIG. 6 is a side elevation view of the preferred embodiment of the holder of the present invention shown in FIG. 1.
- FIG. 7 is a perspective view of a preferred embodiment of the connection of the present invention showing the preferred embodiment of the holder of the present invention shown in FIG. 1.
- 35 FIG. 8 is a perspective view of an alternate preferred embodiment of the connection of the present invention.

1 FIG. 9 is a top plan view of the alternate preferred embodiment of the holder of the present invention shown in FIG. 8.

FIG. 10 is a front elevation view of the alternate preferred embodiment of the holder of the present invention shown in FIG. 8.

5 FIG. 11 is a bottom plan view of the alternate preferred embodiment of the holder of the present invention shown in FIG. 8.

FIG. 12 is a back elevation view of the alternate preferred embodiment of the holder of the present invention shown in FIG. 8.

10 FIG. 13 is a side elevation view of the alternate preferred embodiment of the holder of the present invention shown in FIG. 8.

FIG. 14 is a perspective view of another alternate preferred embodiment of the holder of the present invention.

15 FIG. 15 is a perspective view of a preferred embodiment of the connection of the present invention showing the preferred embodiment of the holder of the present invention shown in FIG. 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

As seen in FIG. 7 and FIG. 8, the present invention is a connection 1 comprising a support member 2, a holder 3 for compressibly holding a strap connector 4, a strap connector 4 compressibly held by the holder 3, and

20 fastener means 5 attaching the holder 3 to the support member 2.

The form of the holder 3 shown in FIG. 7 is preferably formed from a molded polymer. The form of the holder 3 shown in FIG. 8 is preferably formed from cut, punched, bent and embossed sheet metal.

Strap tie holdowns 4 are anchors that are partially embedded in a cementitious member. Strap tie holdowns 4 generally consist of a flat elongated upper section 301 connected to an embedment section 302. They are preferably made from sheet metal which is punched and formed to create the strap connection. The embedment section 302 is usually formed with a hook 303 at its end, and the embedment section 302 lies at an angle to the upper section 301. In a typical connection 1, the upper section 301 of the strap tie holdown 4 is preferably formed with openings 304 that receive fasteners such as nails or screws that connect the strap tie holdown 4 to a vertically disposed framing member.

In a preferred form of the present invention the support member 2 is a formboard for containing a concrete foundation during pouring and setting

1 and the strap connector 4 is a strap tie holdown. Formboards can take many shapes and be made from many different materials.

Preferably, the strap connector 4 has a first face **6** and a second face **7**, and the holder 3 comprises an attachment portion **8**, compression means **9** and retaining means **10** for retaining the compression means **9** to the attachment portion **8**.

Preferably, the first face **6** and the second face **7** are opposed side faces. Preferably, faces **6** and **7** are the broader faces of the strap connector 4, and the openings 304 are made in these faces **6** and **7**.

10 In a preferred form of the present invention, the attachment portion **8** of the holder 3 has a first surface **11** that interfaces with the first face **6** of the strap connector 4 and the compression means **9** of the holder 3 has a second surface **12** that interfaces with the second face **7** of the strap connector 4, compressibly holding the strap connector 4.

15 As seen in FIG. 7, the attachment portion **8** of the holder 3 preferably further comprises a first portion **13** for attaching the holder 3 to the support member 2 in combination with fastener means 5, and a second portion **14** joined to the first portion **13** wherein the first surface **11** of the attachment portion **8** is located on the second portion **14**.

20 As best seen in FIG. 1, the retaining means of the holder 3 preferably further comprises a third flange **15** joined to the second portion **14**, a fourth flange **16** joined to the second portion **14**, a fifth flange **17** joined to the third flange **15**, a sixth flange **18** joined to the fourth flange **16**. Although the fifth flange **17** and the sixth flange **18** are preferably separate, they can 25 converge to create a four-sided sleeve with an attachment portion **8**.

Preferably, the fifth flange **17** and the second portion **14** converge toward each other, and the sixth flange **18** and the second portion **14** converge toward each other.

30 Preferably, the first portion **13** is a first flange and the second portion **14** is a second flange disposed substantially orthogonally to the first flange **13**, the third flange **15** is disposed substantially orthogonally to the second flange **14**, the fourth flange **16** is disposed substantially orthogonally to the second flange **14**, the fifth flange **17** is disposed substantially orthogonally to the third flange **15**, and the sixth flange **18** is disposed substantially 35 orthogonally to the fourth flange **16**.

- 1 Preferably, the second flange 14 is joined to the first flange 13 at a first linear juncture 19, the third flange 15 is joined to the second flange 14 at a second linear juncture 20, the fourth flange 16 is joined to the second flange 14 at a third linear juncture 21, the fifth flange 17 is joined to the 5 third flange 15 at a fourth linear juncture 22, and the sixth flange 18 is joined to the fourth flange 16 at a fifth linear juncture 23.

In the preferred form of the present invention, the fourth linear juncture 22 and the second linear juncture 20 converge toward the first linear juncture 19, and the fifth linear juncture 23 and the third linear 10 juncture 21 converge toward the first linear juncture 19.

Preferably, the compression means 9 of the holder 3 is a wedge dimensioned to closely fit within the space defined by the second, third, fourth, fifth and sixth linear flanges 11, 15, 16, 17 and 18.

Preferably, the wedge further comprises a tapered portion 24 having a 15 broad end 25 and a narrow end 26 and a tab 27 joined to the tapered portion 24 at the broad end 25.

Preferably, the tapered portion 24 of the wedge 9 further comprises a pair of raised guides 28 on the second surface 12 that closely fit the strap connector 4, and the attachment portion 8 of the holder 3 further comprises 20 a first reference tab 29 and a second reference tab 30. Reference tabs 29 and 30 align the first surface 11 of the holder 3 with the edge of the support member 2, so that the strap connector will be aligned with the edge of the support member 2. If the present invention is formed from a molded polymer, or similarly plastic material, the wedge 9 may be hollowed out in 25 order to save material and, therefor, cost and weight.

Preferably, the attachment portion 8 of the holder 3 further comprises a planar gusset 31 that is perpendicular to and connects the first flange 13 and the second flange 14.

Preferably, the first flange 13 of the attachment portion 8 further 30 comprises fastener openings 32, and the fastener means 5 are fasteners. Fastener means 5 can also be a bracket, clip or clamp that interfaces with the support member 2. In the most preferred form of the invention, the fasteners 5 are 2 8d duplex nails, the duplex head allowing for easy removal, but the fasteners 5 may be nails, screws or tacks.

35 The connection 1 of the present invention is preferably made with this preferred embodiment by fixing the holder 3 to the support member 2,

- 1 setting the first face 6 of the strap connector 4 against the first surface 11 of the holder 3 at the proper elevation, and inserting the compression means 9 or wedge into the retaining means 10 and pushing downwardly on the compression means 9 until the compression means 9 in conjunction with the
- 5 retaining means 10 and the attachment portion compressibly hold the strap connector 4. The foundation 300 is then poured, the foundation 300 sets, the compression means 9 is removed, and the holder 3 is unfixed from the support member 2. Vertical framing members are then erected and the strap connector 4 is attached to one of the vertical framing members by typical
- 10 fasteners such as nails.

In an alternate preferred embodiment of the present invention, the holder 3 further comprises a transition portion 134 connected to said attachment portion 108 having a first surface 111 that interfaces with the first face 6 of the strap connector 4, the compression means 109 of the

- 15 holder 3 has a second surface 112 that interfaces with the second face 7 of the strap connector 4, compressibly holding the strap connector 4 and the compression means 109 is a screw with a proximal end 135 and a distal end 136 and the second surface 112 being at the distal end 136, and the retaining means is a retaining portion 137 attached to the transition portion
- 20 134, the retaining portion 137 having a threaded opening 138 that threadably receives the screw 109. Preferably, the screw 109 is a thumb screw that can be screwed and unscrewed without tools.

Preferably, the attachment portion 108 further comprises a fastener portion 139 fixing the holder 3 to the support member 2 in combination with

- 25 fastener means 5. Preferably, the transition portion 134 further comprises a first strap receiving portion 140 with a first slot 141 closely dimensioned to receive the strap connector 4, the first surface 111 being a side of the first slot 141, and a second strap receiving portion 142, with a second slot 143 closely dimensioned to receive the strap connector 4, the first surface 111
- 30 being in line with a side of the second slot 143.

Preferably, the holder 3 further comprises a fourth flange 144 joined to the fastener portion 139.

Preferably, the retaining portion 137 is a second flange disposed substantially orthogonally to the first strap receiving portion 140, the second

- 35 strap receiving portion 142 is a third flange disposed substantially

1 orthogonally to the second flange 137, and the fourth flange 144 is disposed substantially orthogonally to the fastener portion 139.

Preferably, the second flange 137 is joined to the first strap receiving portion 140 at a first linear juncture 145, the first strap receiving portion 140 5 is an extension of the attachment portion 108, the third flange 142 is joined to the second flange 137 at a second linear juncture 146, and the fourth flange 144 is joined to the fastener portion 139 at a third linear juncture 147.

Preferably, the first linear juncture 145, the second linear juncture 146 10 and the third linear juncture 147 are reinforced with raised embossments 148, the fastener portion 139 further comprises fastener openings 149, and the fastener means 5 are fasteners. In the most preferred form of the invention, the fasteners 5 are 2 8d duplex nails, the duplex head allowing for easy removal, but the fasteners 5 may be nails, screws or tacks.

15 The connection 1 of the present invention is preferably made with this alternate preferred embodiment by fixing the holder 3 to the support member 2, sliding the strap connector 4 through the first slot 141 and the second slot 143 until the strap connector 4 is correctly positioned, and turning the thumb screw 109 to compressibly hold the strap connector 4. The 20 foundation 300 is then poured, the foundation 300 sets, the thumb screw 109 is unscrewed, the holder 3 is unfixed from the support member 2, the holder 3 is slid off of the strap connector 4, vertical framing members are then erected and the strap connector 4 is attached to one of the vertical framing members.

25 As shown in FIG. 14, in another alternate preferred embodiment of the present invention, the attachment portion 208 further comprises a first portion 250 for attaching the holder 3 to the support member 2 in combination with fastener means 5, and a wedge 251 having a first surface 211, the wedge 251 being joined to the first portion 250. Preferably, the 30 compression means 209 is part of a sleeve 213. The compression means 209 is a first wall 214 of the sleeve 213. The first wall 214 has a second surface 212 closely dimensioned to fit the wedge 251 such that the strap connector 4 passes through the sleeve 213 and is compressed between the first surface 211 of the wedge 251 and the second face 212 of the sleeve 35 213. The retaining means 210 are incorporated in the sleeve 213 as side walls 215 and an opposed wall 216 from the first wall 214, all in connection

- 1 to the first wall 214. In this preferred embodiment, the retaining means 210 and the compression means are incorporated in a sleeve 213 with the four walls shown; however, either the first wall 214 or the opposed wall 216 could be discontinuous and consist of two separated flanges joined to the
5 side walls 215.

The connection 1 of the present invention is preferably made with this alternate preferred embodiment by fixing the holder 3 to the support member 2, sliding the sleeve 213 over the strap connector 4, positioning the strap connector 4, and sliding the sleeve 209 over the wedge 251 to compressibly
10 hold the strap connector 4. The foundation 300 is then poured, the foundation 300 sets, the sleeve 213 is released, the holder 3 is unfixed from the support member 2, vertical framing members are then erected and the strap connector 4 is attached to one of the vertical framing members.

Although the connection formed in accordance with the present
15 invention has been described in detail, the above description is not intended to limit the scope of this invention except as stated in the claims.

20

25

30

35

1 WE CLAIM:

1. A connection comprising:
 - a. a support member;
 - b. a holder for compressibly holding a strap connector;
 - c. a strap connector compressibly held by said holder; and
 - d. fastener means attaching said holder to said support member.
2. The connection of claim 1 in which:
 - a. said support member is a formboard for containing a concrete foundation during pouring and setting; and
 - b. said strap connector is a strap tie holdown.
3. The connection of claim 1 in which:
 - a. said strap connector has a first face and a second face; and
 - b. said holder comprises an attachment portion, compression means and retaining means for retaining said compression means to said attachment portion.
4. The connection of claim 3 wherein:
 - 20 said attachment portion of said holder has a first surface that interfaces with said first face of said strap connector and said compression means of said holder has a second surface that interfaces with said second face of said strap connector, compressibly holding said strap connector.
- 25 5. The connection of claim 4 wherein said attachment portion of said holder further comprises:
 - a. a first portion for attaching said holder to said support member in combination with fastener means; and
 - b. a second portion joined to said first portion wherein said first 30 surface of said attachment portion is located on said second portion.
6. The connection of claim 5 in which said retaining means of said holder further comprises:
 - a. a third flange joined to said second portion;
 - b. a fourth flange joined to said second portion;
 - c. a fifth flange joined to said third flange;

- 1 d. a sixth flange joined to said fourth flange.
7. The connection of claim 6 wherein:
- 5 a. said fifth flange and said second flange converge toward each other; and
- b. said sixth flange and said second flange converge toward each other.
8. The connection of claim 7 wherein:
- 10 a. said first portion is a first flange and said second portion is a second flange disposed substantially orthogonally to said first flange;
- b. said third flange is disposed substantially orthogonally to said second flange;
- c. said fourth flange is disposed substantially orthogonally to said 15 second flange;
- d. said fifth flange is disposed substantially orthogonally to said third flange; and
- e. said sixth flange is disposed substantially orthogonally to said fourth flange
- 20
9. The connection of claim 8 wherein:
- a. said second flange is joined to said first flange at a first linear juncture;
- b. said third flange is joined to said second flange at a second 25 linear juncture;
- c. said fourth flange is joined to said second flange at a third linear juncture;
- d. said fifth flange is joined to said third flange at a fourth linear juncture; and
- 30 e. said sixth flange is joined to said fourth flange at a fifth linear juncture.
10. The connection of claim 9 wherein said compression means of said holder is a wedge dimensioned to closely fit within the space defined by said 35 second, third, fourth, fifth and sixth flanges.

- 1 11. The connection of claim 10 wherein said wedge further comprises:
a tapered portion having a broad end and a narrow end and a tab
joined to said tapered portion at said broad end.
- 5 12. The connection of claim 11 wherein:
a. said tapered portion of said wedge further comprises a pair of
raised guides on said second surface that closely fit said strap connector;
and
b. said attachment portion of said holder further comprises a first
10 reference tab and a second reference tab.
13. The connection of claim 12 wherein said attachment portion of said
holder further comprises a planar gusset that is perpendicular to and
connects said first flange and said second flange.
- 15 14. The connection of claim 13 wherein:
a. said first flange of said attachment portion further comprises
fastener openings; and
b. said fastener means are fasteners.
- 20 15. The connection of claim 3 wherein:
a. said holder further comprises a transition portion connected to
said attachment portion having a first surface that interfaces with said first
face of said strap connector;
- 25 b. said compression means of said holder has a second surface
that interfaces with said second face of said strap connector, compressibly
holding said strap connector and said compression means is a screw with a
proximal end and a distal end and said second surface being at said distal
end; and
- 30 c. said retaining means is a retaining portion attached to said
transition portion, said retaining portion having a threaded opening that
threadably receives said screw.
16. The connection of claim 15 wherein:

35

- 1 a. said attachment portion further comprises a fastener portion
fixing said holder to said support member in combination with fastener
means;
- 2 b. said transition portion further comprises:
- 5 i. a first strap receiving portion with a first slot closely
dimensioned to receive said strap connector, said first surface being a side of
said first slot ; and
- 6 ii. a second strap receiving portion, with a second slot
closely dimensioned to receive said strap connector, said first surface being
10 in line with a side of said second slot.

17. The connection of claim 16, wherein said holder further comprises a
fourth flange joined to said fastener portion.

- 15 18. The connection of claim 16, wherein:
- 16 a. said retaining portion is a second flange disposed substantially
orthogonally to said first strap receiving portion;
- 17 b. said second strap receiving portion is a third flange disposed
substantially orthogonally to said second flange; and
- 20 c. said fourth flange is disposed substantially orthogonally to said
fastener portion.

- 25 19. The connection of claim 18, wherein:
- 26 a. said second flange is joined to said strap receiving portion at a
first linear juncture;
- 27 b. said third flange is joined to said second flange at a second
linear juncture; and
- 28 c. said fourth flange is joined to said fastener portion at a third
linear juncture.

- 30 20. The connection of claim 19, wherein:
- 31 a. said first linear juncture, said second linear juncture and said
third linear juncture are reinforced with raised embossments;
- 32 b. said fastener portion further comprises fastener openings; and
- 33 c. said fastener means are fasteners.

- 1 21. The connection of claim 3 in which:
- a. said attachment portion further comprises:
 - i. a first portion for attaching said holder to said support member in combination with fastener means; and
 - 5 ii. a wedge having a first surface, said wedge being joined to said first portion;
 - b. said compression means is a sleeve having a second surface closely dimensioned to fit said wedge such that said strap connector passes through said sleeve and is compressed between said first surface of said 10 wedge and said second surface of said sleeve, and said retaining means are incorporated in said compression means.

15

20

25

30

35

1

ABSTRACT

A strap connector is compressibly held to a support member by a holder which is connected to the support member by fasteners. The support member can be a formboard for containing a concrete foundation during pouring and setting, and the strap connector is a strap tie holdown.

10

15

20

25

30

35

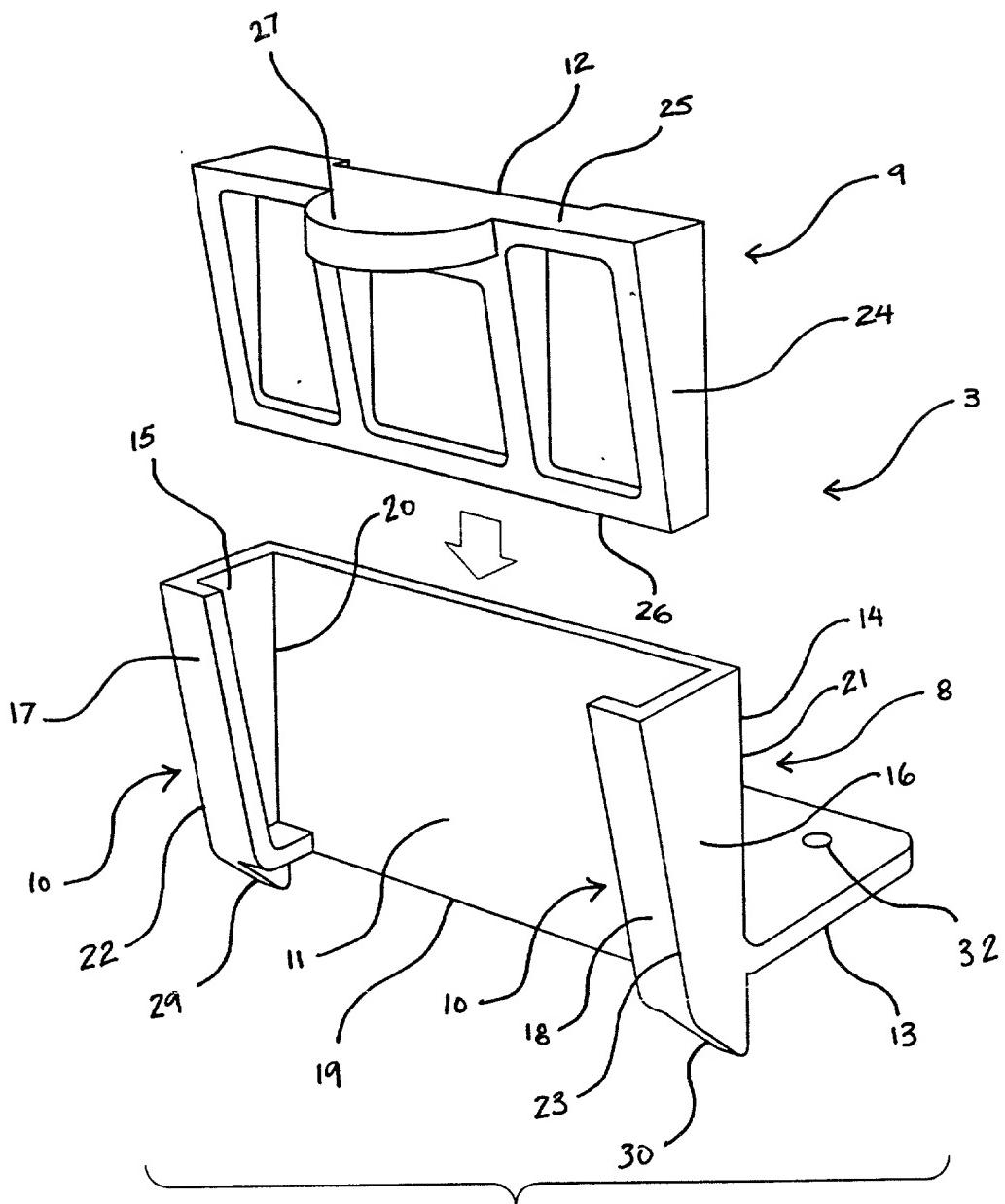
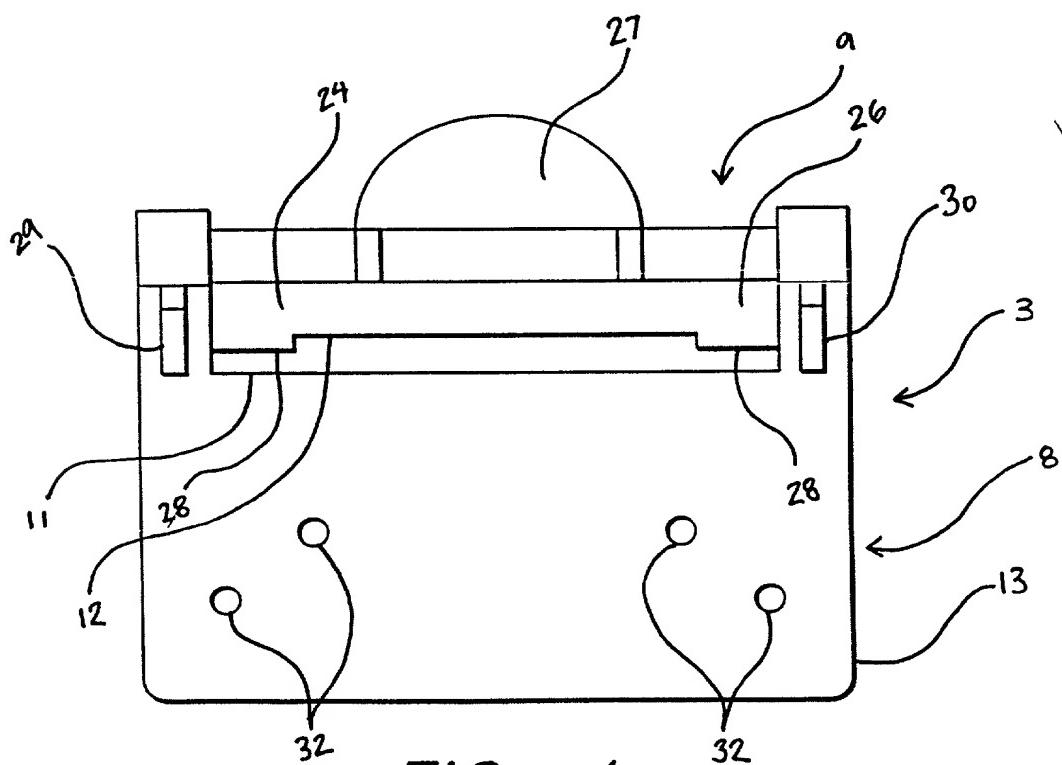
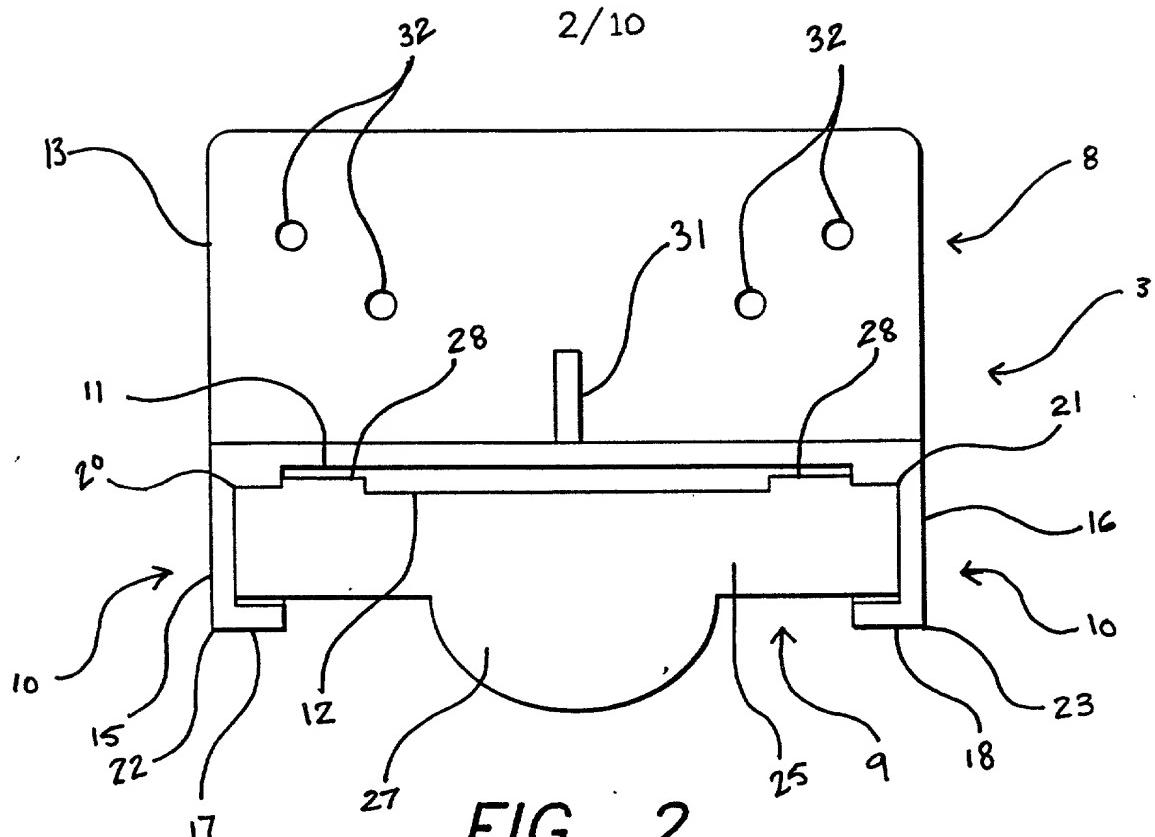
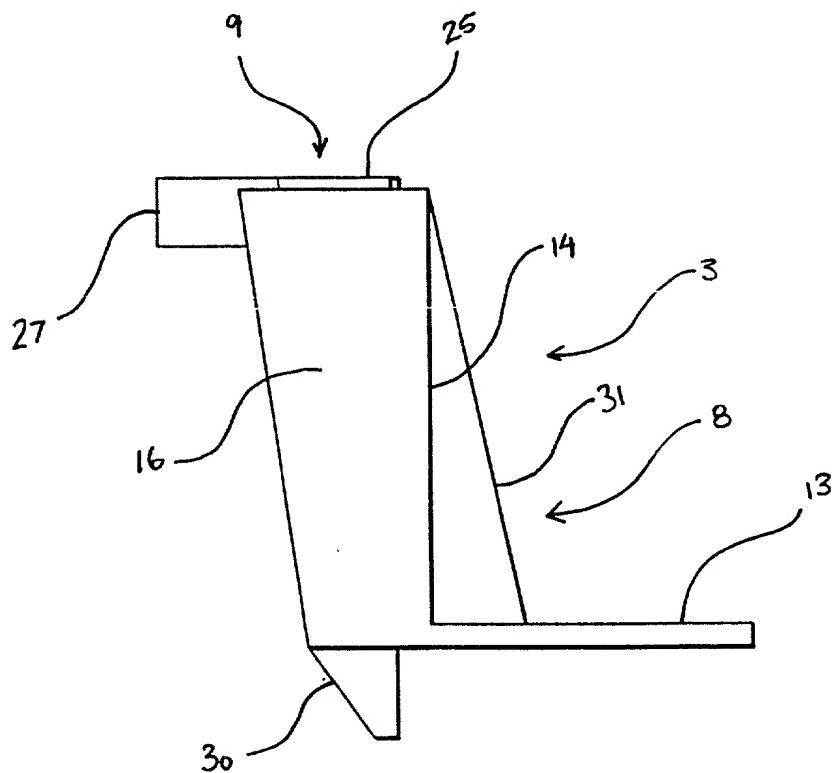
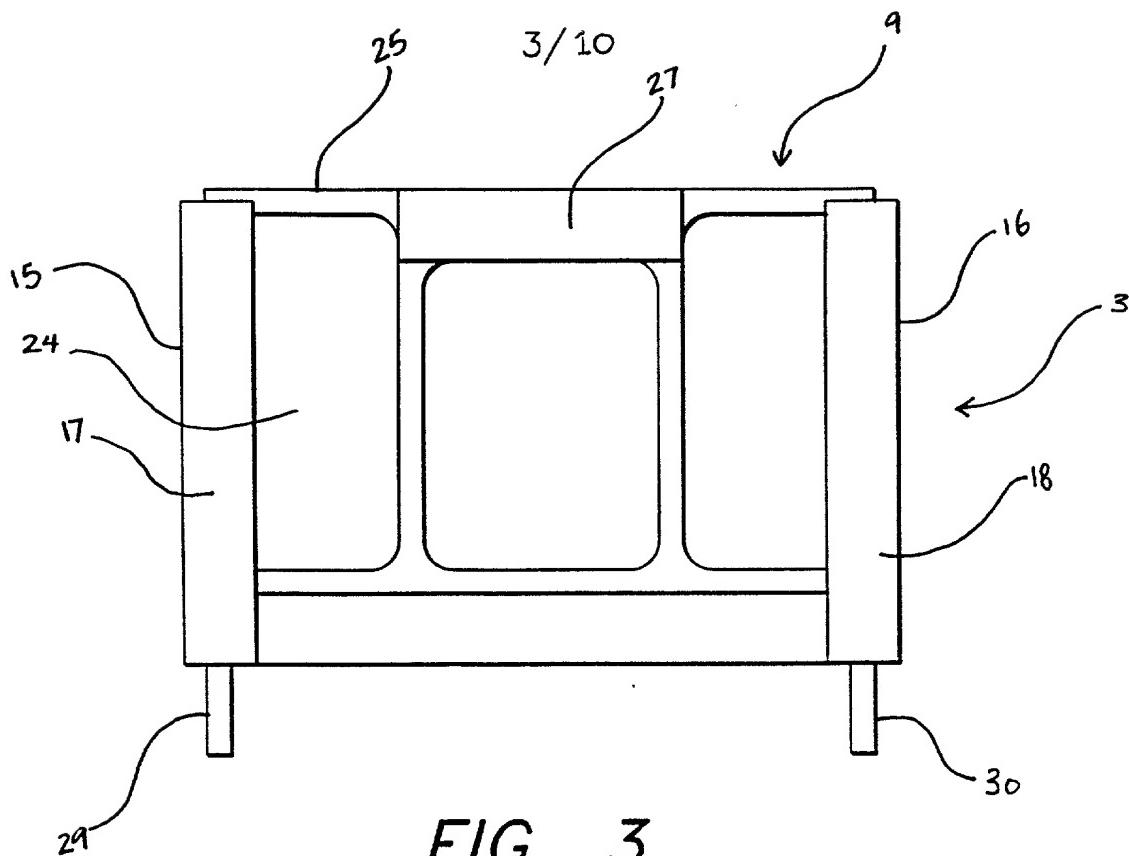


FIG.- 1

EL668416569





4/10

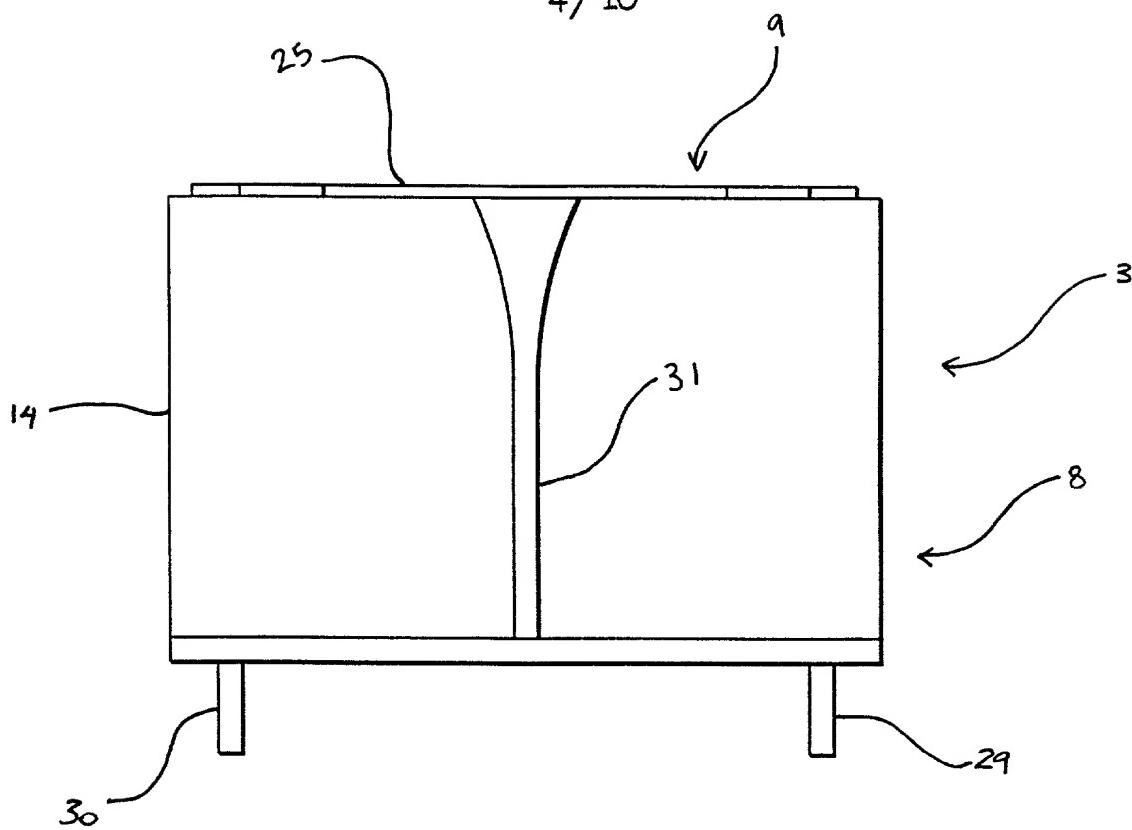


FIG. 5

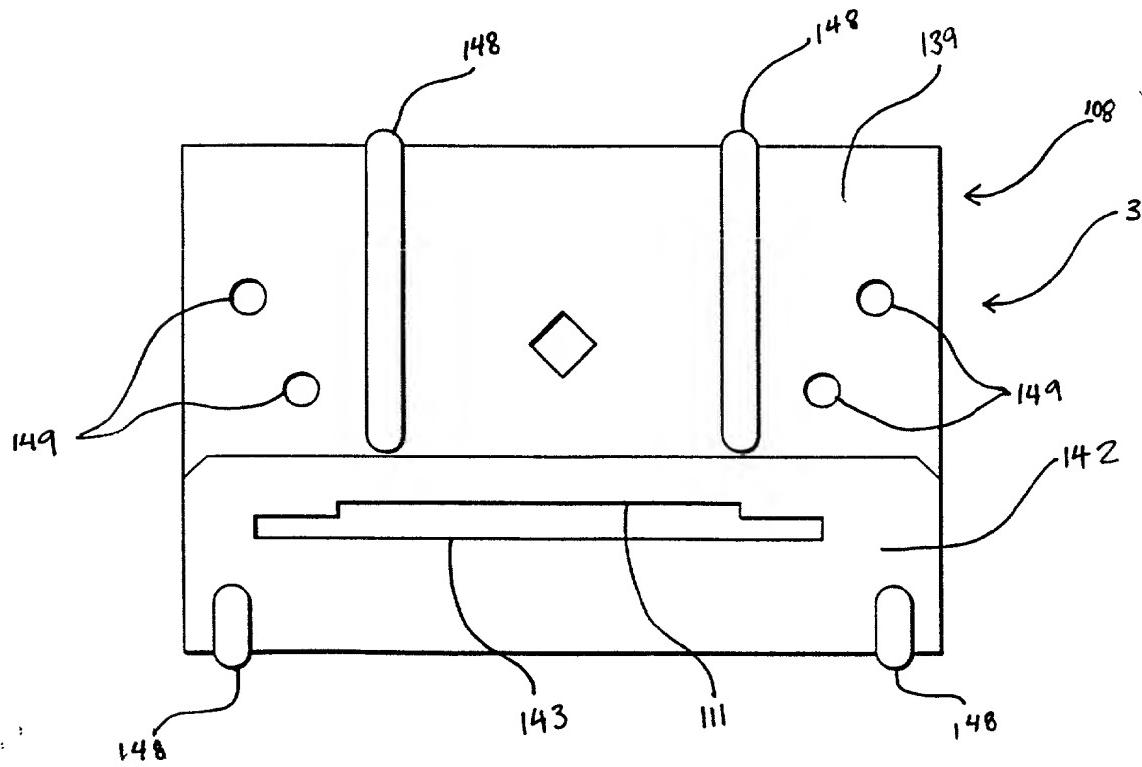
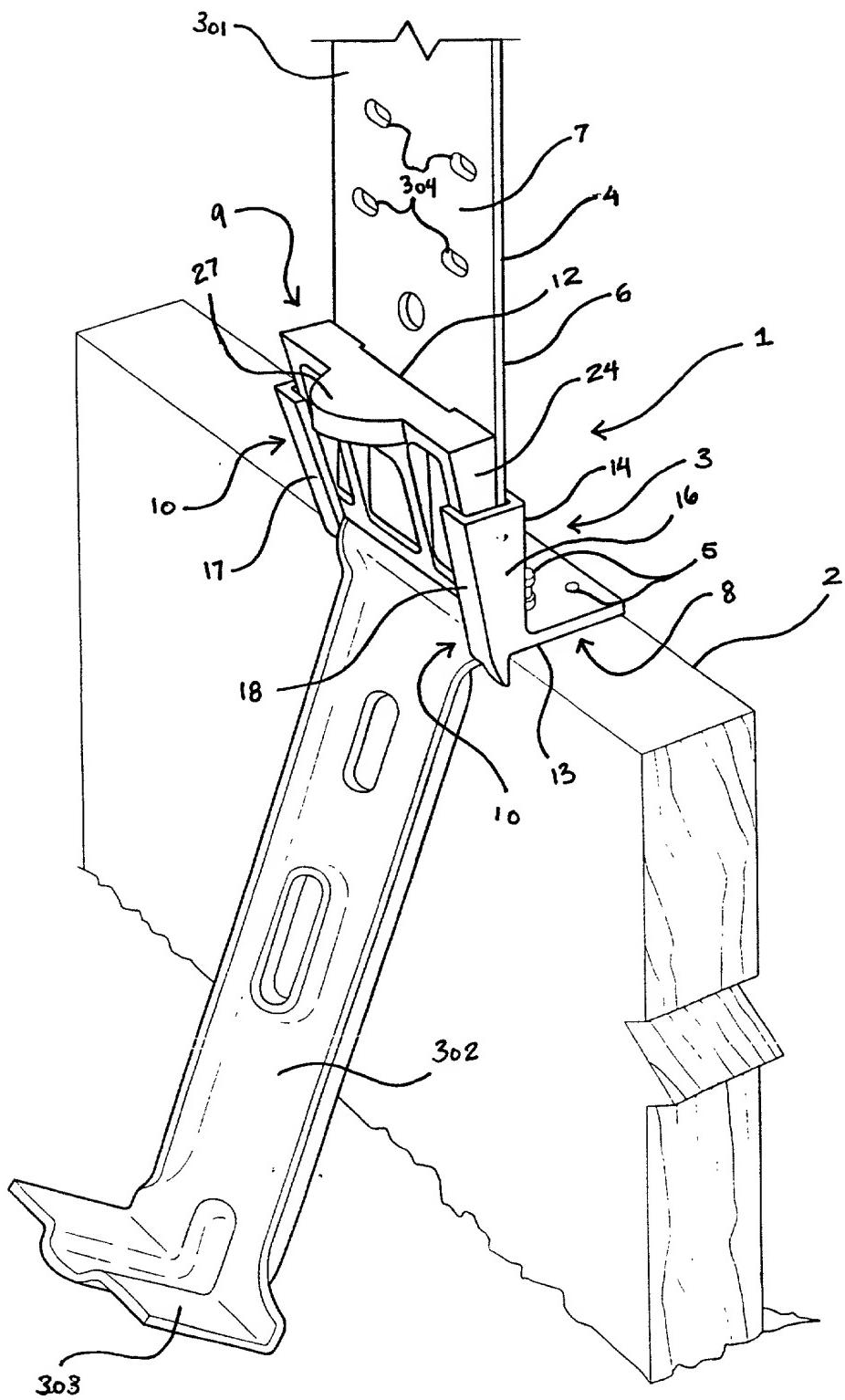


FIG. 9

**FIG. 7**

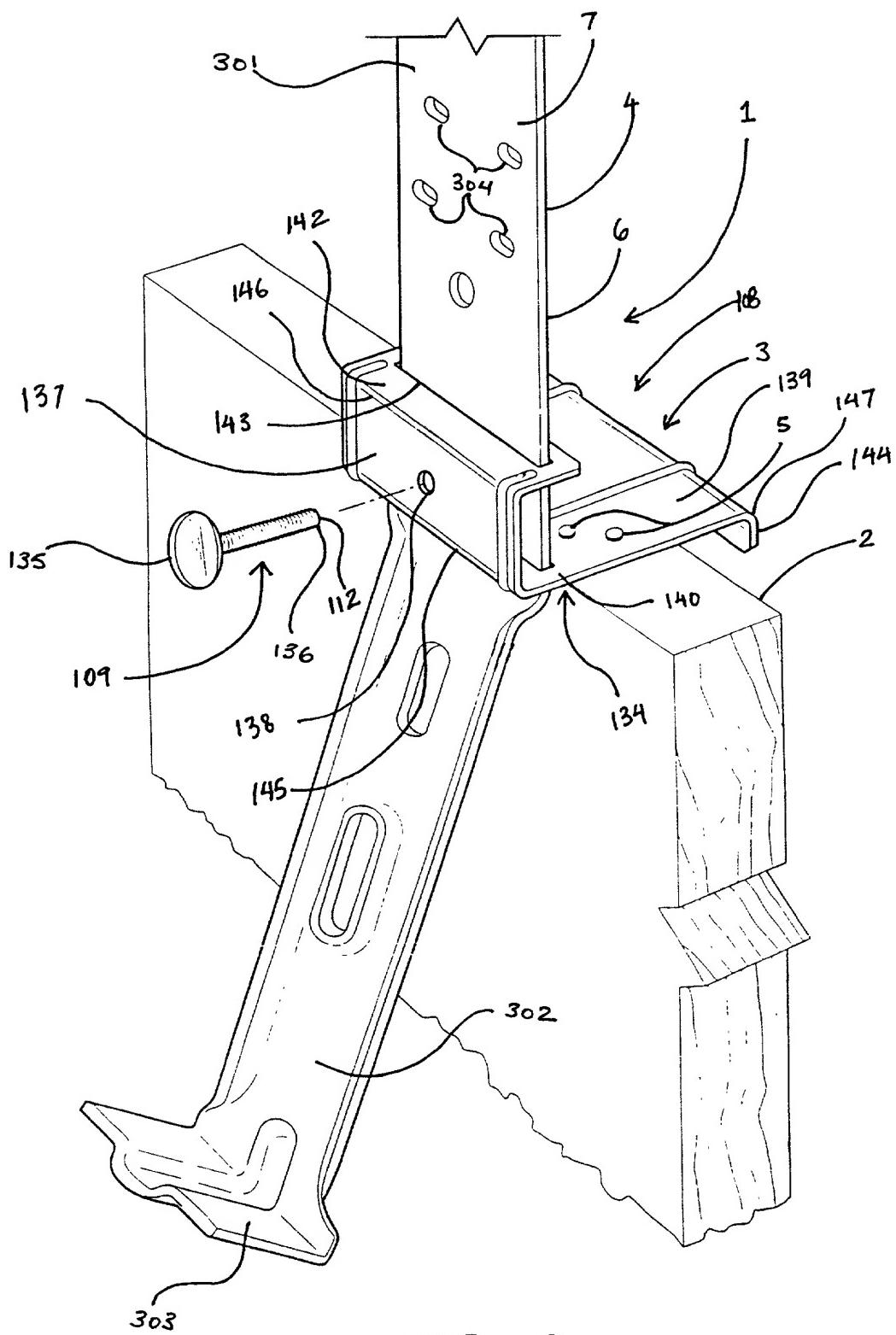


FIG. 8

7/10

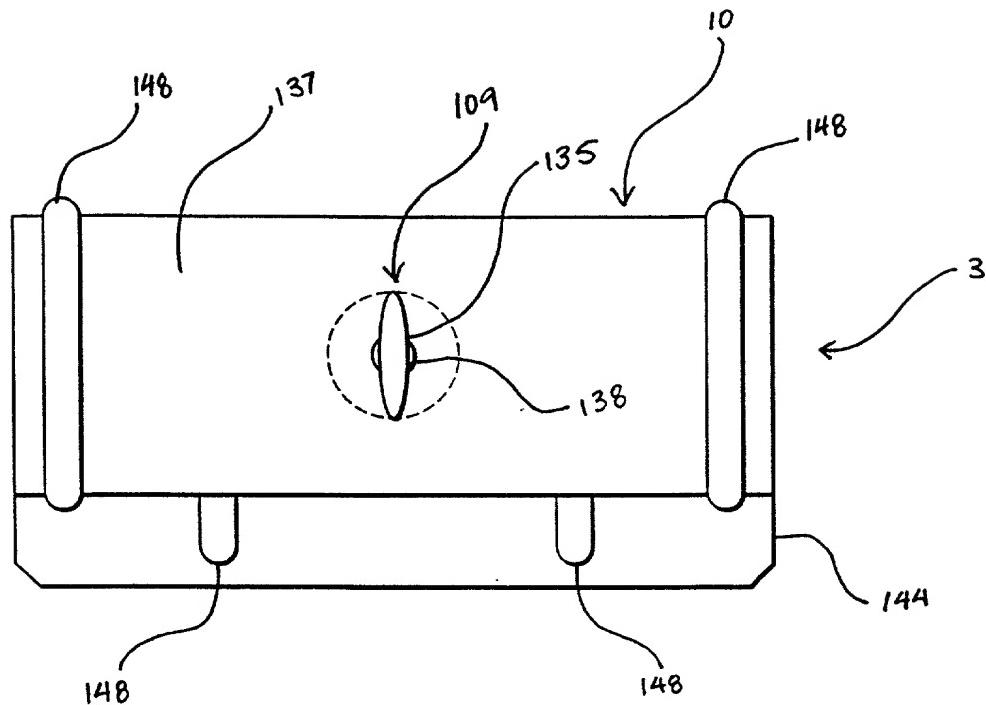


FIG.-10

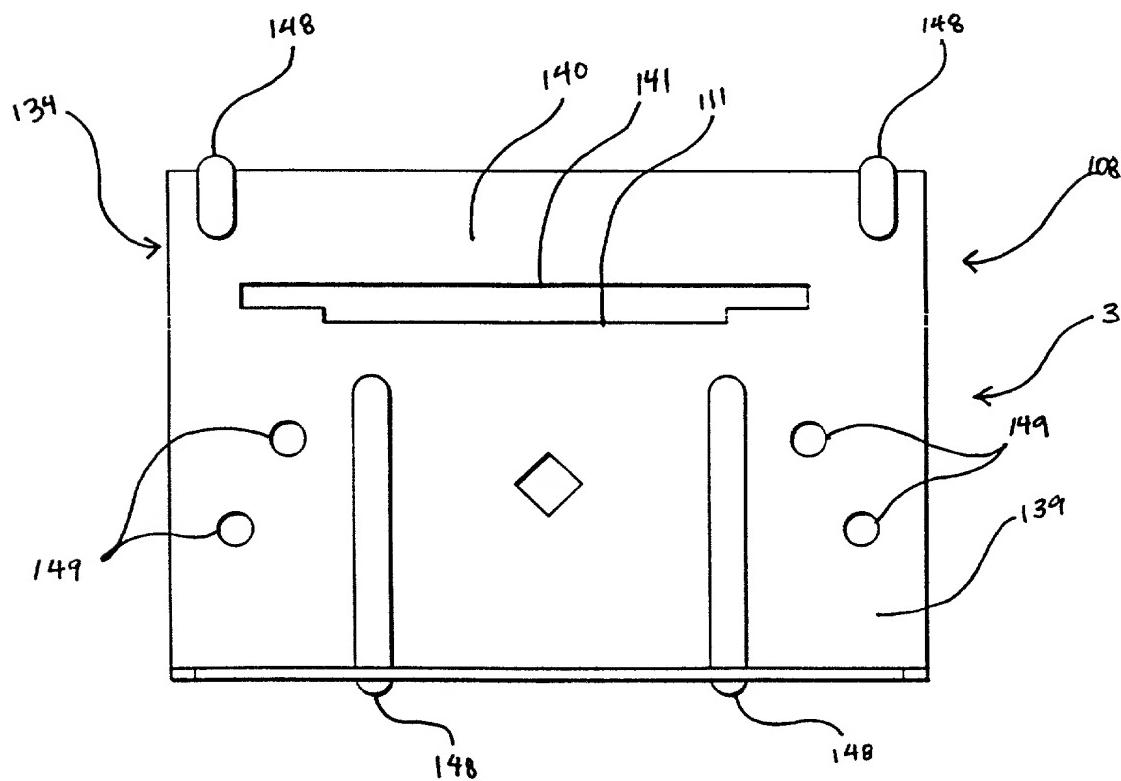


FIG.-11

8/10

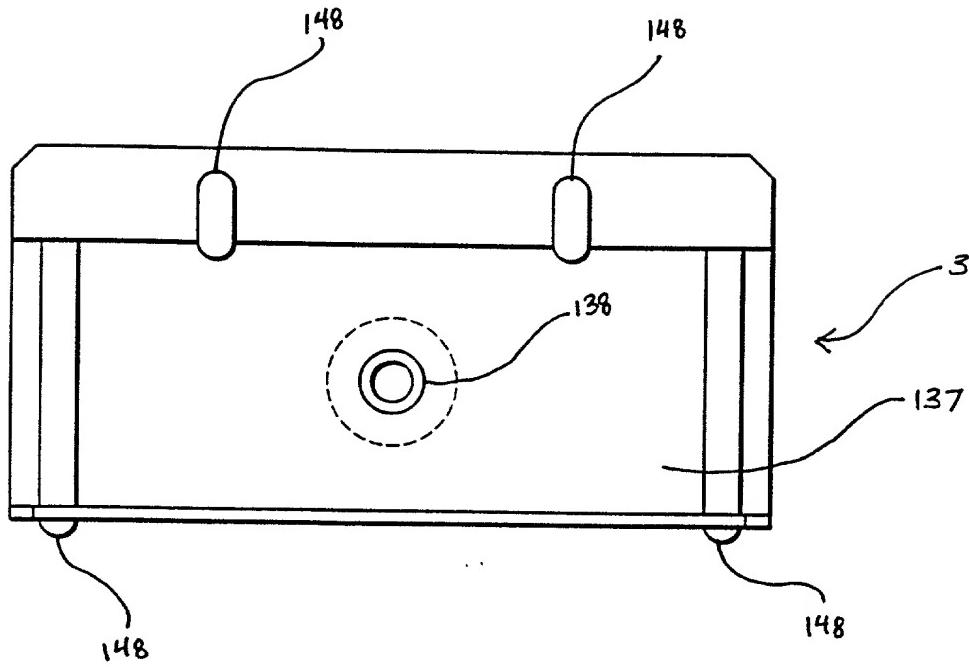


FIG.-12

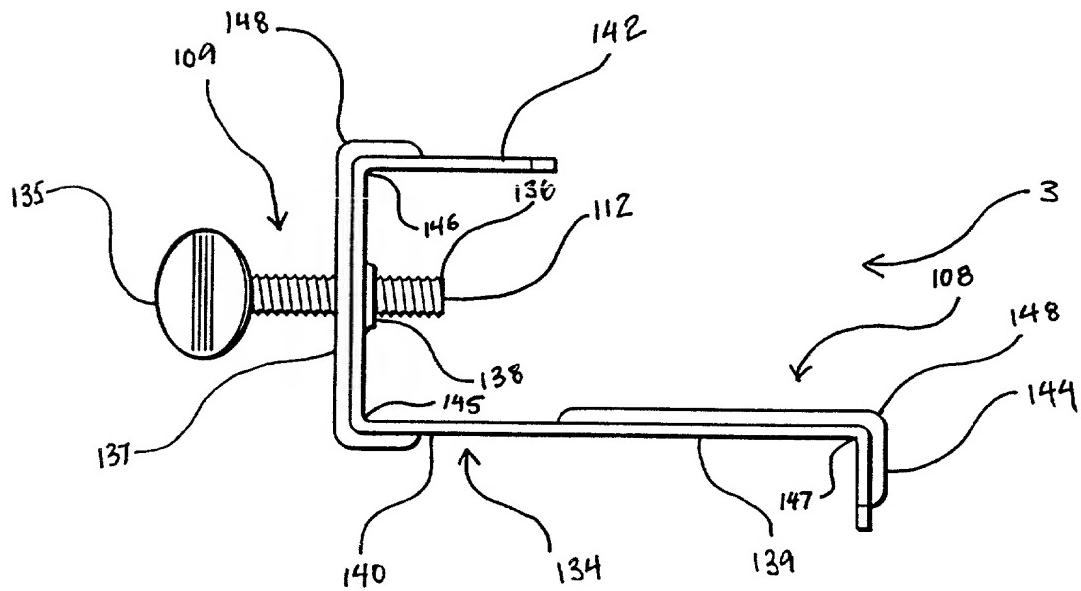


FIG.-13

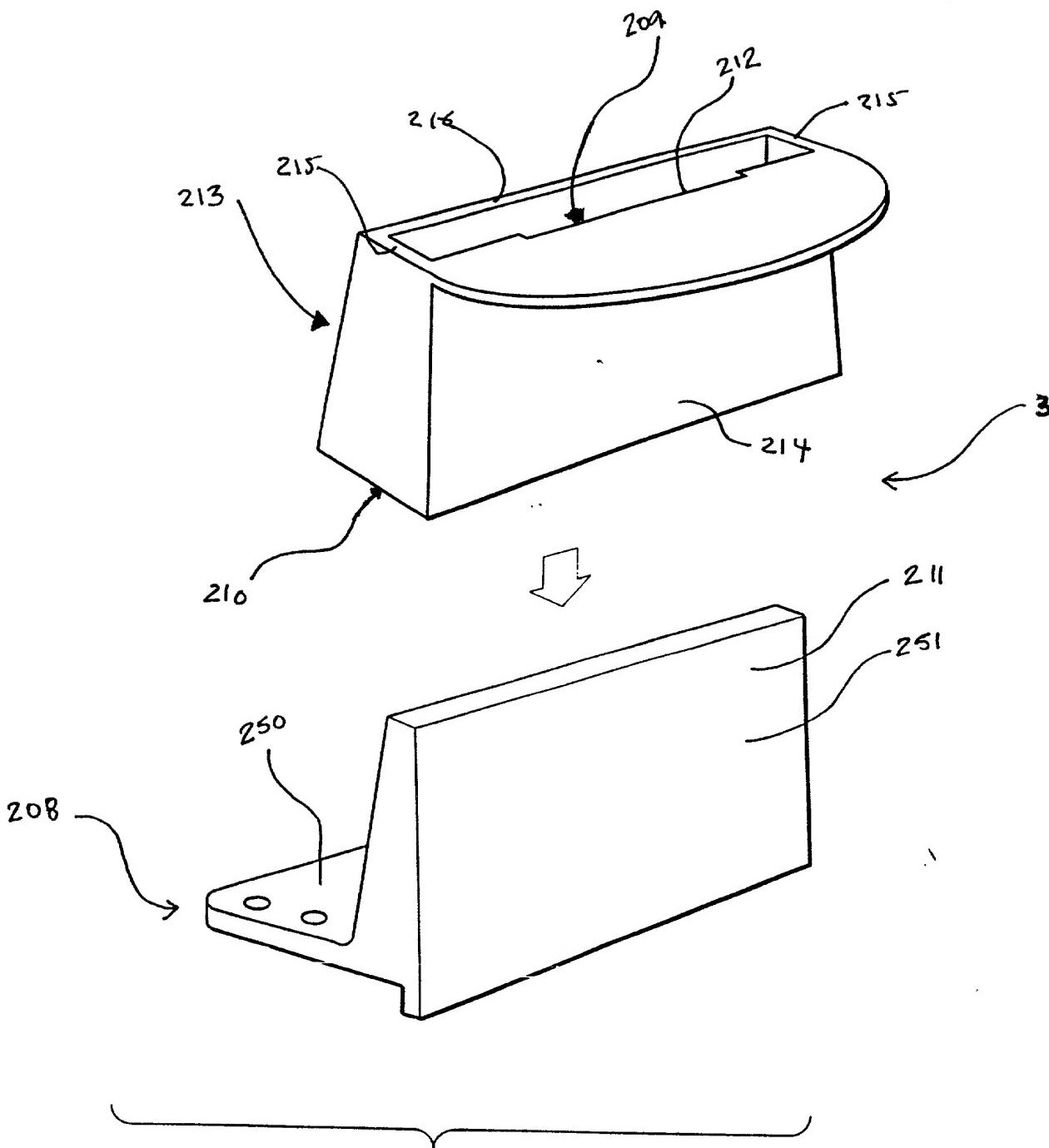


FIG. 14

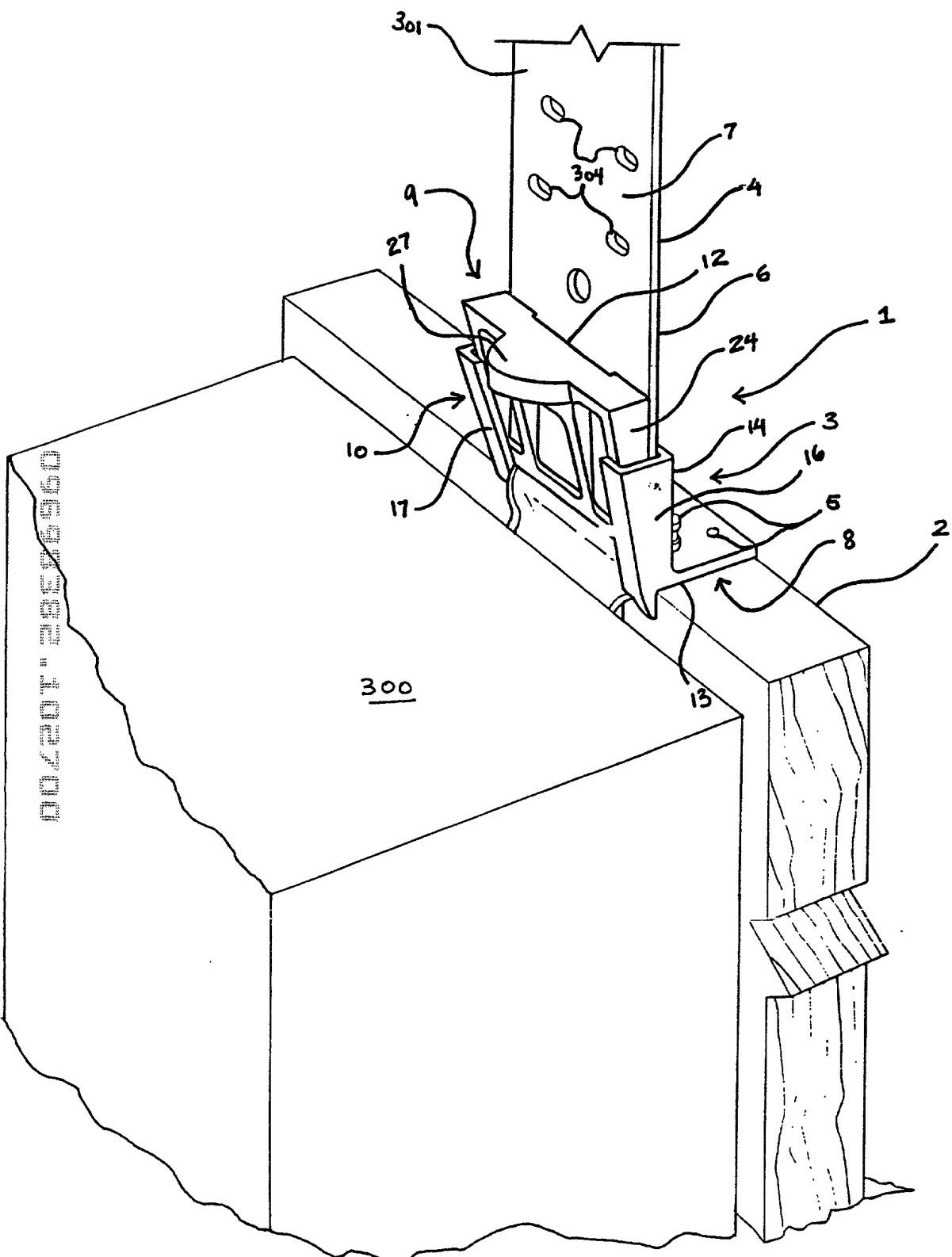


FIG. 15